PATENT APPLICATION

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8/27/02
1 of 3

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE HONORABLE BOARD OF PATENT APPEALS AND INTERFERENCES

In re the Application of:

Toshiaki HASHIZUME et al.

On Appeal From
Group Art Unit: 2858

Application No.: 09/214,519

Examiner: E. LeRoux

Filed: January 7, 1999

Docket No.: 101850

For: OPTICAL MODULATION ELEMENT AND PROJECTION DISPLAY DEVICE

# BRIEF ON APPEAL



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## I. INTRODUCTION

This Appeal is from an Office Action mailed November 29, 2001, finally rejecting claims 1-19 of the above-identified patent application. No claims are allowed.

### A. Real Party-In-Interest

The real party-in-interest board this Appeal and the present application is Seiko Epson Corporation, by way of an assignment recorded in the U.S. Patent and Trademark Office at Reel 010097, Frame 0852.

### B. Statement of Related Appeals and Interferences

There are presently no appeals or interferences, known by Appellants, Appellants' representatives or the assignee, which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending Appeal.

### C. Status of Claims

Claims 1-19 are pending, stand rejected, and are on appeal. The claims on appeal are set forth in the attached Appendix. Claims 1, 4, 14, 18 and 19 are independent. Claims 2-3 depend from claim 1. Claims 5-13 depend from claim 4. Claims 15-17 depend from claim 14.

### D. Status of Amendments

An Amendment After Final Rejection Under 37 C.F.R. §1.116 was filed in the U.S. Patent and Trademark Office on February 28, 2002 in response to the November 29, 2001 Office Action. A March 6, 2002 Advisory Action indicates that the February 28, 2002 Amendment will be entered upon the timely submission of a Notice of Appeal and Appeal Brief with the requisite fees. All claim amendments have been entered of record.



## II. SUMMARY OF THE INVENTION

### A. Prior Art Problems Overcome by the Invention

A projection display device typically includes a light source lamp unit, an optical unit for optically processing a light flux emitted from the light source lamp unit so as to

synthesize a color image according to image information, a projection lens unit for magnifying and projecting the synthesized light flux onto a screen, a power supply unit, and a circuit substrate on which a control circuit and the like are mounted.

Figs 11A-11C show a conventional optical unit 9A and a projection lens unit 6 of a projector display device. As shown in Fig. 11A, the optical unit 9a includes a lamp body 81 serving as a light source, a color separation optical system 924 for separating a light flux W emitted from the lamp body 81 into color light fluxes R, G, and B of the primary colors, red (R), green (G), and blue (B), three liquid crystal modulation elements (optical modulation elements) 925R, 925G, 925B for modulating each of the separated color light fluxes according to image information, and a color synthesizing prism 910 shaped like a prism with a square cross section to synthesize the modulated color light fluxes.

To enhance the contrast of an image to be magnified and projected onto a screen 10, a polarizer 961R, 961G, 961B having a high wavelength selectivity with respect to polarized light, may be bonded to the light outgoing surfaces of each of liquid-crystal modulation elements 925R, 925G, 925B. However, such a polarizer 961R, 961G, 961B absorbs much light, and therefore, generates much heat. Inside a projection display device, air flow AIR FLOW is formed and cools the polarizers 961R, 961G, 961B. However, because the polarizer 961R, 961G, 961B is directly attached to the light outgoing surface of the liquid-crystal modulation element 925R, 925G, 925B, heat is likely to be transmitted to the liquid-crystal modulation element 925R, 925G, 925B, thus increasing the temperature of the liquid-crystal modulation element 925R, 925G, 925B. This increase in temperature deteriorates the optical properties of a liquid-crystal panel and the image contrast. One conventional approach to reduce this effect or minimize the problem is to place the polarizer 961R, 961G, 961B apart from the light outgoing surfaces of the liquid-crystal modulation element 925R, 925G, 925B. However, if the polarizer 961R, 961G, 961B is simply placed apart from the

light outgoing surface, there is concern that the switching element in the liquid-crystal modulation element 925R, 925G, 925B may malfunction due to a light flux reflected by the light outgoing surface of the liquid-crystal modulation element 925R, 925G, 925B. Moreover, there is concern that dust or the like, which may be caused by the air flow formed inside the projection display device, may adhere to the light outgoing surfaces of the liquid-crystal modulation elements 925R, 925G, 925B. This condition would make it impossible for the projection display device to achieve a high-quality image projection.

B. Embodiment of the Invention

The invention provides systems and methods that provide an optical modulation element and a projection display device that achieves high-quality image projection by preventing dust from adhering to the light outgoing surfaces of the optical modulation element without deteriorating the switching characteristic of the optical modulation element.

Fig. 1 shows the external appearance of the projection display device 1 of this embodiment. The projection display device 1 has an outer casing 2 that consists of an upper casing 3, a lower casing 4, and a front casing 5. The leading end of a projection lens unit 6 protrudes from the center of the front casing 5. As shown in Figs. 2 and 3, the projection display device 1 includes a power supply unit 7, a light source lamp unit 8, an optical unit 9, an interface substrate 11 having an input-output interface circuit, a video substrate 12 with a video signal processing circuit, a control substrate 13 for controlling the drive of the device, speakers 14R and 14L, and a floppy-disk drive unit 18. The projection display device also includes a number of fans, such as a cooling fan 15A, a circulating fan 15B, an exhaust fan 16, and an auxiliary cooling fan 30. [In the original specification, the reference number for the auxiliary cooling fan is 17].

FIG. 5 schematically shows the optical system incorporated in the projection display device 1 of this embodiment. The projection display device 1 includes a color separation

optical system 924, three liquid crystal modulation elements 925R, 925G, 925B for modulating the respective color light fluxes Red, Green, and Blue, a color synthesizing prism 910, and a light guide system 927 for guiding and projecting the synthesized color light fluxes onto a screen 10.

Figs. 6A-6C show in more detail the liquid crystal modulation elements or optical modulation elements 925R, 925G, 925B. The flat liquid crystal modulation elements 925R, 925G, 925B face three sides (light incident surfaces) 911R, 911G, 911B of the color synthesizing prism 910. Incident-side polarizers 960R, 960G, 960B serving as polarizing elements are placed at a predetermined distance from light incident surfaces 9251R, 9251G, 9251B of the liquid crystal modulation elements 925R, 925G, 925B, respectively. Polarizers 961R, 961G, 961B are bonded to light incident surfaces 911R, 911G, 911B of the color synthesizing prism 910. In this embodiment, the outgoing-side polarizers 961R, 961G, 961B are apart from the light outgoing surfaces 9252R, 9252G, 9252B of the liquid crystal modulation elements 925R, 925G, 925B.

Transparent plates 970R, 970G, 970B are bonded to the light outgoing surfaces 9252R, 9252G, 9252B of the liquid crystal modulation elements 925R, 925G, 925B. Transparent plates 970R, 970G, 970B are made of the same material as that of substrates (not shown) for sandwiching a polarizing layer of the members for constituting the outgoing-side polarizers 961R, 961G, 961B, for example, triacetate cellulose.

The optical axes of the transparent plates 970R, 970G, 970B almost align with the optical axes of the outgoing-side polarizers 961R, 961G, 961B. Moreover, antireflection thin films are formed on the outgoing-side surfaces of the transparent plates 970R, 970G, 970B by evaporation. The antireflection films prevent light reflection at the interface surfaces between the liquid crystal modulation elements 925R, 925G, 925B and air because of the difference in refractive index. This arrangement eliminates return light to the liquid crystal

modulation elements 925R, 925G, 925B, and prevents the malfunction of the liquid crystal modulation elements 925R, 925G, 925B.

FIG. 7 shows a structure in which such liquid crystal modulation elements 925R, 925G, 925B are attached to the light incident surfaces of the color synthesizing prism 910 via a mounting member 70R. Using the mounting member 70R as an example, it includes a mounting frame plate 71 for holding the liquid crystal modulation element 925R and the transparent plate 970R. The mounting frame plate 71 includes first and second frame plates 72, 73 between which the liquid crystal modulation element 925R and the transparent plate 970R are sandwiched and held. The mounting member 70R also includes a fixed frame plate 74 fixedly bonded to the light incident surface 911R of the color synthesizing prism 910. The mounting frame plate 71 is detachably fixed to the fixed frame plate 74 via an intermediate frame plate 75.

The mounting frame plate 71 may be made of a resin containing glass fiber, which helps it maintain a constant temperature and a uniform in-plane temperature distribution of the liquid crystal modulation elements 925R, 925G, 925B. Furthermore, the mounting frame plate 71 may be made of metal, thus making it possible to improve the heat radiation effect.

In the projection display device 1, because the outgoing-side polarizers 961R, 961G, 961B are apart from the light outgoing surfaces 9252R, 9252G, 9252B of the liquid crystal modulation elements 925R, 925G, 925B, the heat generated by the outgoing-side polarizers 961R, 961G, 961B can be prevented from being transmitted to the liquid crystal modulation elements 925R, 925G, 925B. This makes it possible to limit the increase in temperature of the liquid crystal modulation elements 925R, 925G, 925B, and to prevent the deterioration of the optical properties thereof.

Furthermore, because the liquid crystal modulation elements 925R, 925G, 925B and the outgoing-side polarizers 961R, 961G, 961B are apart from each other, the light emitted

from the liquid crystal modulation elements 925R, 925G, 925B is widely spread, and the polarizers 961R, 961G, 961B can receive the light in a wide area. As a result, it is possible to decrease the heat generated by the polarizers 961R, 961G, 961B per unit area, and to permit easy heat radiation.

Inside the projection display device 1, an air flow is generally formed as shown by the arrow in FIG. 6(B). In a conventional device, if the light outgoing surfaces 9252R, 9252G, 9252B of the liquid crystal modulation elements 925R, 925G, 925B are exposed, they would be covered by the dust that is diffused by the air flow. However, in the projection display device 1 of this invention, since the transparent plates 970R, 970G, 970B are bonded to the light outgoing surfaces 9252R, 9252G, 9252B of the liquid crystal modulation elements 925R, 925G, 925B, the significant disadvantages mentioned above can be significantly reduced and/or eliminated.

Furthermore, because the transparent plates 970R, 970G, 970B are made of the same material as that of the substrates for sandwiching the polarizing layer of the polarizers 961R, 961G, 961B, the number of types of components can be reduced. Moreover, because the substrates for sandwiching the polarizing layer are bonded to the liquid crystal modulation element, they cause few defects. Therefore, image degradation due to the defects of the transparent plate can be naturally prevented by making the transparent plate of the same material as that of the substrates for sandwiching the polarizing layer.

Furthermore, by forming the transparent plates 970R, 970G, 970B on the light incident surfaces of the liquid crystal modulation elements 925R, 925G, 925B, any dust particles that adhere to the light incident surface of the liquid crystal modulation element are inconspicuous on the projection screen 10.

It will be noted that the transparent plates 970R, 970G, 970B may be formed on both the light incident and outgoing surfaces of the liquid crystal modulation elements 925R, 925G, 925B.

Another advantage of this invention is to have the surfaces of transparent plates 970R, 970G, 970B coated with a surface active agent (interfacial active agent), or treated for electrostatic protection, which would make it difficult for dust to adhere to the surfaces of the transparent plates 970R, 970G, 970B.

In addition, polarizers 961R, 961G, 961B may be bonded to the transparent plates 970R, 970G, 970B. In this case, it is possible to prevent dust from entering between the liquid crystal modulation elements 925R, 925G, 925B and the polarizers 961R, 961G, 961B, and thus prevent the polarization condition of light from being disturbed by dust.

FIG. 8 schematically shows the projection display device 1 of a second embodiment, where the three liquid crystal modulation elements 925R, 925G, 925B and a color synthesizing prism 910 are completely enclosed by a partition 983 that tightly surrounds the liquid crystal modulation elements 925R, 925G, 925B. Inside the partition 983, a fan 987 is located to circulate air.

The partition 983 has light incident windows at the positions opposing light incident surfaces 9251R, 9251G, 9251B of the three liquid crystal modulation elements 925R, 925G, 925B. The light incident windows are provided with transparent plates 980R, 980G, 980B made of glass or the like. Incident-side polarizers 960R, 960G, 960B are bonded to the outsides of the transparent plates 980R, 980G, 980B.

Transparent plates 980R, 980G, 980B may be coated with a surface active agent (interfacial active agent), or treated for electrostatic protection, which make it difficult for dust to adhere to the surface.

C. The Claimed Invention

1. Claim 1

Claim 1 recites an optical modulation apparatus 9 that modulates a light flux emitted from a light source 8 according to image information. The optical modulation apparatus 9 includes an optical modulation device 925R, 925G, 925B and a transparent plate 970R, 970G, 970B bonded to at least one surface 9251R, 9251G, 9251B, 9252R, 9252G, 9252B of the optical modulation device 925R, 925G, 925B.

2. Claims 2-3

Additional features of the invention recited in claim 1 are found in dependent claims 2-3.

Claim 2 recites that a polarizer 961R, 961G, 961B is bonded to the transparent plate 970R, 970G, 970B.

Claim 3 recites that the surface of the transparent plate 970R, 970G, 970B is coated with a surface active agent or treated for electrostatic protection.

3. Claim 4

Claim 4 recites a projector 1 that includes a light source 8, an optical modulation device 925R, 925G, 925B that modulates a light flux emitted from the light source 8 according to image information, a projection unit 6 that magnifies and projects the light flux modulated by the optical modulation device 925R, 925G, 925B, and a transparent plate 970R, 970G, 970B formed on a light emitting surface 9252R, 9252G, 9252B of the optical modulation device 925R, 925G, 925B.

4. Claims 5-13

Additional features of the invention recited in claim 4 are found in dependent claims 5-13.

Claim 5 recites that an anti-reflection film is formed on at least one surface of the transparent plate 970R, 970G, 970B.

Claim 6 recites that the thickness of the transparent plate 970R, 970G, 970B is larger than the focal depth of the projection unit 1.

Claim 7 recites that a polarizer 961R, 961G, 961B having an optical axis is interposed between the transparent plate 970R, 970G, 970B and the projection unit 6. The transparent plate 970R, 970G, 970B is made of a drawing resin and has an optical axis. The optical axis of the transparent plate 970R, 970G, 970B substantially aligns with the optical axis of the polarizer 961R, 961G, 961B.

Claim 8 recites that the polarizer 961R, 961G, 961B includes a polarizing layer and a pair of substrates that sandwich the polarizing layer. The substrates are made of a substrate material. The transparent plate 970R, 970G, 970B is made of the substrate material used in making the substrates.

Claim 9 recites that the polarizer 961R, 961G, 961B is bonded to the transparent plate 970R, 970G, 970B.

Claim 10 recites that the transparent plate 970R, 970G, 970B has a surface coated with a surface active agent or treated for electrostatic protection.

Claim 11 recites that the projector 1 includes a mounting member 70R and a color synthesizing prism 910. The optical modulation device 925R, 925G, 925B is mounted via the mounting member 70R on the color synthesizing prism 910. The mounting member 70R includes a mounting frame plate 71, a fixed frame plate 74, and an intermediate frame plate 75 sandwiched between the mounting frame plate 71 and the fixed frame plate 74. The mounting frame plate 71 has of a first frame member 72 and a second frame member 73 that sandwich the optical modulation device 925R, 925G, 925B. The fixed frame plate 74 is in a fixed contact with a light incident surface 911R of the color synthesizing prism 910.

Claim 12 recites that the mounting frame plate 71 is made of resin containing glass fiber.

Claim 13 recites that the mounting frame plate 71 is made of metal.

5. Claim 14

Claim 14 recites a projector 1 that includes a light source 8, a plurality of optical modulation devices 925R, 925G, 925B that modulate a light flux emitted from the light source 8 according to image information, a prism 910 that synthesizes the light flux modulated by the plurality of optical modulation devices 925R, 925G, 925B, a projection unit 6 that magnifies and projects the light flux synthesized by the prism 910, and a partition 983 that surrounds the plurality of optical modulation devices 925R, 925G, 925B and the prism 910 via an air layer and thereby separates the plurality of optical modulation devices 925R, 925G, 925B and the prism 910 from the light source 8 and the projection unit 6. The partition 983 has a transparent plate 980R, 980G, 980B fitted in a light incident window corresponding to a light incident surface 9251R, 9251G, 9251B of at least one optical modulation device 925R, 925G, 925B. The partition 983 also has a light outgoing window 990 that emits the light flux modulated by the at least one optical modulation device 925R, 925G, 925B.

6. Claims 15-17

Additional features of the invention recited in claim 14 are found in dependent claims 15-17.

Claim 15 recites that the projector 1 includes a fan 987 that circulates air located inside the partition 983.

Claim 16 recites that a polarizer 960R, 960G, 960B is bonded to the transparent plate 980R, 980G, 980B.

Claim 17 recites that the transparent plate 980R, 980G, 980B has a surface that is coated with a surface active agent or is treated for electrostatic protection.

7. Claim 18

Claim 18 recites a projector 1 that includes a light source 8, an optical modulation device 925R, 925G, 925B that modulates a light flux emitted from the light source 8 according to image information, a transparent plate 970R, 970G, 970B bonded to the light emitting surface 9252R, 9252G, 9252B of the optical modulation device 925R, 925G, 925B, a power supply unit 7, an interface circuit 11, a control circuit 13 that controls the optical modulation device 925R, 925G, 925B, and an outer casing 2 that accommodates the light source 8, the optical modulation device 925R, 925G, 925B, the transparent plate 970R, 970G, 970B, the power supply unit 7, the interface circuit 11, and the control circuit 13.

8. Claim 19

Claim 19 recites a projector 1 that includes a light source 8, an optical modulation device 925R, 925G, 925B that modulates a light flux emitted from the light source 8 according to image information, a projection unit 6 that magnifies and projects the light flux modulated by the optical modulation device 925R, 925G, 925B, a partition 983 that surrounds the optical modulation device 925R, 925G, 925B via an air layer and thereby separates the optical modulation device 925R, 925G, 925B from the light source 8 and the projection unit 6, a power supply unit 7, an interface circuit 11, a control circuit 13 that controls the optical modulation device 925R, 925G, 925B, and an outer casing 2 that accommodates the light source 8, the optical modulation device 925R, 925G, 925B, the partition 983, the power supply unit 7, the interface circuit 11, and the control circuit 13.

III. ISSUES AND REJECTIONS

The November 29, 2001 Office Action rejects the claims over prior art. Specifically, claims 1, 2, 4 and 6-9 are rejected under 35 U.S.C. §102(b) as anticipated by U.S. Patent No. 5,508,834 to Yamada et al. (hereinafter "the 834 patent"); claims 14-16 are rejected under 35 U.S.C. §102(b) as anticipated by U.S. Patent No. 6,007,205 to Fujimori (hereinafter

"the 205 patent"); claim 5 is rejected under 35 U.S.C. §103(a) as unpatentable over the 834 patent in view of U.S. Patent No. 5,865,521 to Hashizume et al. (hereinafter "the 521 patent"); claims 3 and 10 are rejected under 35 U.S.C. §103(a) as unpatentable over the 834 patent in view of U.S. Patent No. 5,212,573 to Yamazaki et al. (hereinafter "the 573 patent"); claims 11-13 are rejected under 35 U.S.C. §103(a) as unpatentable over the 834 patent in view of U.S. Patent No. 5,868,485 to Fujimori et al. (hereinafter "the 485 patent"); claim 17 is rejected under 35 U.S.C. §103(a) as unpatentable over the 205 patent in view of the 573 patent; and claims 18 and 19 are rejected under 35 U.S.C. §103(a) as unpatentable over the 834 patent in view of U.S. Patent No. 5,260,730 to Williams (hereinafter "the 730 patent").

Thus, the issues on appeal are whether:

A) the subject matter of each of claims 1, 2, 4 and 6-9 is distinguishable under 35 U.S.C. §102(b) over the 834 patent;

B) the subject matter of each of claims 14-16 is distinguishable under 35 U.S.C. §102(b) over the 205 patent;

C) the subject matter of claim 5 would have been obvious under 35 U.S.C. §103(a) over the 834 patent in view of the 521 patent;

D) the subject matter of each of claims 3 and 10 would have been obvious under 35 U.S.C. §103(a) over the 834 patent in view of the 573 patent;

E) the subject matter of each of claims 11-13 would have been obvious under 35 U.S.C. §103(a) over the 834 patent in view of the 485 patent;

F) the subject matter of claim 17 would have been obvious under 35 U.S.C. §103(a) over the 205 patent in view of the 573 patent; and

G) the subject matter of each of claims 18-19 would have been obvious under 35 U.S.C. §103(a) over the 834 patent in view of the 730 patent.

IV. GROUPING OF CLAIMS

Each claim of this patent application is separately patentable, and upon issuance of a patent or be entitled to a separate presumption of validity under 35 U.S.C. §282. For convenience in the handling of this Appeal, the claims are grouped as follows:

Group I, Claim 1;

Group II, Claims 2-3;

Group III, Claim 4;

Group IV, Claims 5 and 7-13;

Group V, Claim 6;

Group VI, Claim 14;

Group VII, Claims 15-17;

Group VIII, Claim 18; and

Group IX, Claim 19.

Each of Groups I-IX will be argued separately in the following arguments. The groups do not stand or fall together.

V. ARGUMENT

A. The Law

1. Law Regarding Factual Inquiries to Determine Novelty

In order to be anticipatory under 35 U.S.C. §102, a prior art reference must have each and every feature set forth in the claims. This rule was not properly applied by the Examiner in formulating the rejection of claims 1, 2, 4, 6-9 and 14-16. Particularly, the differences between the prior art and the claims were not properly determined.

2. Law Regarding Factual Inquiries to Determine Obviousness/Non-Obviousness

Several basic factual inquiries must be made to determine obviousness or non-obviousness of patent application claims under 35 U.S.C. §103. These factual inquiries are set forth in Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966):

> Under §103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or non-obviousness of the subject matter is determined.

The specific factual inquiries set forth in Graham have not been considered or properly applied by the Examiner in formulating the rejection of claims 3, 5, 10-13 and 17-19. Particularly, the differences between the prior art and the claims were not properly determined. As stated by the Federal Circuit in In re Ochiai, 37 USPQ2d 1127, 1131 (Fed. Cir. 1995):

> [t]he test of obviousness *vel non* is statutory. It requires that one compare the claim's subject matter as a whole with the prior art to which the subject matter pertains. 35 U.S.C. §103. The inquiry is thus highly fact-specific by design.... When the references cited by the Examiner fail to establish a *prima facie* case of obviousness, the rejection is improper and will be overturned. In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). (Emphasis added.)

In rejecting claims under 35 U.S.C. §103, an Examiner bears in initial burden of presenting a *prima facie* case of obviousness. A *prima facie* case of obviousness is established only if the teachings of the prior art would have suggested the claimed subject matter to a person of ordinary skill in the art. If an Examiner fails to establish a *prima facie* case, the rejection is improper and will be overturned. See In re Rijckaert, 9 F.3d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993). "If examination ... does not produce a *prima facie* case of unpatentability, then without more the applicant is entitled to the grant of the patent." In re Oetiker, 977 F.2d 1443, 1445-46, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992).

B. Rejections Under 35 U.S.C. §102(b)

1. Position Asserted in the November 29, 2001 Office Action

The Office Action rejects claims 1, 2, 4, 6-9 under 35 U.S.C. §102(b) as unpatentable over the 834 patent. Specifically, the Office Action asserts that the 834 patent discloses:

> an optical modulation element [Fig 5, #5]...a transparent plate [Fig 5, #3]...secured to the optical modulator...a projection unit [Fig. 2, #209]...
>
> ...a polarizer [Fig 5, #9] bonded to the transparent plate...
>
> ...the transparent plate [Fig 5, #3] thickness is larger than the focal length of the projection lens [Fig 2, #209]...
>
> ...the transparent plate is made of resin [Col 6, line 60]...
>
> ...a pair of substrates [Fig 5, #2 and #3].

The Office Action also rejects claims 14-16 under 35 U.S.C. §102(b) as unpatentable over the 205 patent. Specifically, the Office Action asserts that the 205 patent discloses:

> a plurality of optical modulation devices [Fig 12, 925R, 925G, 925B], a prism that synthesizes the light flux [Fig 11, 910], a projection unit [Fig 9, 6], a partition [Fig 12, 1500] that surrounds said plurality of optical modulation devices and said prism, the partition having a transparent plate fitted in an incident window corresponding to a light incident surface [Fig 12] a light outgoing window that emits the light flux modulated by at least one optical modulation device [Fig 12], a fan [Fig 12], a polarizer [Fig 12].

2. The 834 Patent

The 834 patent discloses a liquid-crystal display device with a liquid cell 5, a pair of transparent cover members 6, 7 each of which is mounted to a periphery of the liquid cell, and a pair of polarizers 8, 9 each of which is applied to and associated one of the transparent cover members 6, 7 so that the liquid-crystal cell and the at least one of said polarizers is spaced apart from each other.

The liquid-crystal display device is of an active matrix type and a liquid-crystal cell 1 is composed of a TFT substrate 2 and a CF substrate 3. Both of the substrates are bonded together by a sealant 4, and a liquid-crystal layer 5 is held in a gap therebetween. A pair of transparent cover members 6, 7 are mounted on outer surfaces of the liquid-crystal cell 1. Each of the transparent members is formed in a predetermined configuration and the transparent members are substantially flat and provided with the central recess portions and peripheral flank or flange portions which are in contact with the liquid-crystal cell 1. Polarizing plates 8, 9 are attached to the pair of transparent cover members 6, 7. The polarizing plates 8, 9 are arranged at a sufficient interval from the liquid-crystal cell 1 through the transparent cover members 6, 7 unlike the conventional arrangement.

3. The 205 Patent

The 205 patent discloses an optical lens unit having internalized fan unit and projection apparatus housing the same. The 205 patent discloses light valves 925R, G and B and a prism unit 910. The polarizing plates 981-983 are enclosed by a dustproof box 1500. Square openings 1501-1503 are provided in the three side walls of the box 1500 to which light is incident. Each of the openings 1501-1503 is closed in an airtight state by means of polarizing plates 981-983 fastened to the side wall from the inside thereof. The side of dustproof box 1500 from which light is emitted is open.

C. Rejections Under 35 U.S.C. §103(a)

1. Position Asserted in the November 29, 2001 Office Action

The Office Action rejects claim 5 under 35 U.S.C. §103(a) as unpatentable over the 834 patent in view of the 521 patent; rejects claims 3 and 10 under 35 U.S.C. §103(a) as unpatentable over the 834 patent in view of the 573 patent; rejects claims 11-13 under 35 U.S.C. §103(a) as unpatentable over the 834 patent in view of the 485 patent; rejects claim 17 under 35 U.S.C. §103(a) as unpatentable over the 205 patent in view of the 573 patent; and

rejects claims 18 and 19 under 35 U.S.C. §103(a) as unpatentable over the 834 patent in view of the 730 patent.

Specifically, regarding claim 5, the Office Action asserts that the 834 patent teaches all the claimed features except for the antireflection film on the surface of the transparent plate, and that the 521 patent discloses an antireflection film [Fig 12, 632]. Therefore, the Office Action asserts that it would have been obvious to one of ordinary skill in the art to modify the 834 patent to include an antireflection film as taught by the 521 patent for the purpose of eliminating reflections from the transparent plate.

Regarding claims 3 and 10, the Office Action asserts that the 834 patent teaches all the claimed features except for the transparent plate being treated for electrostatic protection, and that the 573 patent discloses a transparent plate being electrostatically protected [Col 3, lines 1-35]. Therefore, the Office Action asserts that it would have been obvious to one of ordinary skill in the art to modify the 834 patent to include the electrostatic protection as taught by the 573 patent for the purpose of protecting the optical modulator against excessive electrostatic voltage.

Regarding claims 11-13, the Office Action asserts that the 834 patent teaches all the claimed features except for the mounting member, the color synthesizing prism, the fixed frame plate in contact with the color synthesizing prism, and an intermediate frame plate. However, the Office Action asserts that the 485 patent discloses a mounting member [Fig 5], the color synthesizing prism [Fig 5, #22], the fixed frame plate [Fig 5, #54] in contact with the color synthesizing prism [Fig 5, #22], and an intermediate frame plate [Fig 5, #55]. Therefore, the Office Action asserts that it would have been obvious to one of ordinary skill in the art to modify the 834 patent to include the above components as taught by the 485 patent for the purpose of securing the transparent plate and the polarizer to the color synthesizing prism.

Regarding claim 12, the Office Action asserts that the 485 patent discloses the mounting frame being made of resin [Col 10, line 15].

Regarding claim 13, the Office Action asserts that the 485 patent discloses a metal mounting frame [Col 10, line 43].

Regarding claim 17, the Office Action asserts that the 205 patent teaches all the claimed features except for the transparent plate being treated for electrostatic protection, and that the 573 patent discloses a transparent plate being electrostatically protected [Col 3, lines 1-35]. Therefore, the Office Action asserts that it would have been obvious to one of ordinary skill in the art to modify the 730 patent [sic!] to include the electrostatic protection as taught by the 573 patent for the purpose of protecting the optical modulator against excessive electrostatic voltage.

Regarding claims 18 and 19, the Office Action asserts that the 834 patent together with the 730 patent teach all the claimed features except for a power supply unit, an interface unit, a control circuit that controls the optical modulation element, and an outer casing that accommodates the light source, the optical modulation element, the partition, the power supply unit, the interface unit, and the control unit. The Office Action takes official notice of facts outside of the record and asserts that it would have been obvious to one of ordinary skill in the art to include the above components because these components are required for a conventional optical modulation element and projection display device.

2. The 521 Patent

The 521 patent discloses a projection-type display apparatus. The liquid crystal devices according to the 521 patent are active matrix liquid-crystal devices in which pixels are arranged in a matrix with a TFT switching element connected to each pixel and a liquid-crystal layer 620 interposed between a pair of substrates 610, 630 (Fig. 12). The opposed

substrate 630 has an opposed electrode 631 of ITO on its side facing the liquid-crystal layer 620 and an anti-reflection layer 632 on the other side.

3. The 573 Patent

The 573 patent discloses an input protection circuit of electro-optical device constructed in the form of an active matrix liquid display device utilizing non-linear resistive elements. An input protective element is disposed between adjacent input electrodes of the device so as to protect the non-linear resistive elements in the electro-optical device against excessive input and electro-static voltage.

4. The 485 Patent

The 485 patent discloses a projection type display device including a liquid-crystal panel unit attached to a light incident surface of a prism composite.

5. The 730 Patent

The 730 patent discloses an optical overhead projector for electronic images including an LCD device located above a stage of an overhead projector. A lens 20 is fixed to the main structure 21 which is supported on the base of the projector 1. Contained within the base is the light source 2 and the mirror 3. The mirror causes light to project vertically through the fresnel lens 7 which comprises the overhead projector's stage surface.

D. The Claims Define Patentable Subject Matter

1. Claim 1 is Distinguishable Over the 834 Patent

The invention recited in claim 1 is structurally different from Fig. 5 of the 834 patent in numerous respects. For example, Fig. 5 of the 834 patent does not disclose or suggest an optical modulation device, and a transparent plate bonded to at least one surface of the optical modulation device, as claimed in claim 1.

In the 834 patent, a TFT substrate 2 and a CF substrate 3 are bonded together, and a liquid-crystal layer 5 is held in the gap therebetween. By having a liquid inserted in the gap, the 834 patent does not teach or suggest a surface for bonding the plate 2.

Contrary to the Office Action's position, the liquid-crystal 5 is not an optical modulation device. Further, the liquid crystal does not comprise a surface wherein a transparent plate can be bonded to it. Furthermore, the 834 patent does not disclose or even suggest a transparent plate. Elements 16, 17 (Fig. 4) of the 834 patent are light shielding plates (col. 6, lines 10-16) which are merely frames having an aperture at the center.

Further, the 834 patent discloses two transparent cover members 6, 7, as shown in Figure 5, that are disposed such that air gaps are created between the transparent cover members and the optical modulation device 1. That is, these gaps create a heat insulation layer which generates heat on the optical modulation device. Because of this insulation layer, the optical modulation device is adversely affected by the heat because the layer prevents the heat from being dissipated.

Because the 834 patent does not disclose a transparent plate bonded to at least one surface of the optical modulation device, it cannot provide advantages of the claimed invention. Claim 1 recites that the transparent plate is bonded to at least one surface of the optical modulation device. Thus, the 834 patent does not provide the advantage of reducing heat from being directly transmitted to the optical modulation device in helping to reduce the deterioration of the optical properties of the optical modulation device. The structure of the 834 patent is completely devoid of the above-discussed advantages.

Accordingly, for at least the reasons outlined above, the 834 patent fails to teach or disclose all of the features recited in claim 1. Thus, the 834 patent fails to anticipate the subject matter of claim 1 under 35 U.S.C. §102(b).

2. Claim 2 is Distinguishable Over the 834 Patent

Claim 2 depends from claim 1. Dependent claim 2 is likewise distinguishable over the 834 patent for at least the reasons discussed as well as for additional features it recites. Accordingly, for at least the reasons outlined above, the 834 patent fails to teach or disclose

all of the features recited in claim 2. Thus, the 834 patent fails to anticipate the subject matter of claim 2 under 35 U.S.C. §102(b).

3. Claim 3 is Distinguishable Over the 834 and 573 Patents

Claim 3 depends from claim 1. Further, the 573 patent does not make up for the deficiencies of the 834 patent relative to claim 1, discussed above. In particular, there is no teaching, disclosure or suggestion in the 573 patent for a transparent plate bonded to at least one surface of an optical modulation device as recited in claim 1. Thus, the combination of the 834 and 573 patents do not teach, disclose or suggest all of the features of claim 3.

Further, the Office Action has not cited any specific disclosure in the 834 and 573 patents for providing the motivation for modifying the combined apparatus to provide the missing claimed feature, i.e., transparent plate coated with a surface active agent or treated for electrostatic protection. It is submitted that no motivation exists to combine or modify the 834 and 573 patents to provide the missing claimed feature. In fact, such a combination and modification constitutes an impermissible use of Appellants' disclosure based on hindsight reasoning.

Thus, the 834 patent in view of the 573 patent do not render obvious the subject matter of claim 3 under 35 U.S.C. §103(a).

4. Claim 4 is Distinguishable Over the 834 Patent

The invention recited in claim 4 is structurally different from Fig. 5 of the 834 patent in numerous respects. For example, Fig. 5 of the 834 patent does not disclose or suggest an optical modulation device and a transparent plate formed on a light emitting surface of said optical modulation device, as recited in claim 4.

In the 834 patent, a TFT substrate 2 and a CF substrate 3 are bonded together, and a liquid-crystal layer 5 is held in the gap therebetween. By having a liquid inserted in the gap, the 834 patent does not teach or suggest a surface for bonding the plate 2.

Contrary to the Office Action's position, the liquid-crystal 5 is not an optical modulation device. Further, the liquid crystal does not comprise a surface wherein a transparent plate can be formed on it.

Additionally, the 834 patent does not disclose or suggest a transparent plate. Elements 16, 17 of the 834 patent are light shielding plates which are merely frames having an aperture at the center.

Because the 834 patent does not disclose a optical modulation device and a transparent plate formed on a light emitting surface of the optical modulation device, it cannot provide the advantages of the claimed invention. For example, the 834 patent does not provide the advantage of reducing heat from being directly transmitted to the optical modulation device in helping to reduce the deterioration of the optical properties of the optical modulation device. The structure of the 834 patent is completely devoid of the above-discussed advantages.

Accordingly, for at least the reasons outlined above, the 834 patent fails to teach or disclose all of the features recited in claim 4. Thus, the 834 patent fails to anticipate the subject matter of claim 4 under 35 U.S.C. §102(b).

5. Claim 6 is Distinguishable Over the 834 Patent

Claim 6, which depends from claim 4, is likewise distinguishable over the 834 patent for at least the reasons discussed above, as well as for the additional features it recites. For example, the 834 patent does not disclose or suggest the transparent plate having a thickness with the thickness of the transparent plate being set larger than the focal depth of the projection unit, as recited in claim 6.

The 834 patent does not disclose or suggest a transparent plate. Elements 16, 17 of the 834 patent are light shielding plates which are merely frames having an aperture at the center. A TFT substrate 2 and a CF substrate 3 are bonded together, and a liquid-crystal layer

5 is held in the gap therebetween. By having a liquid inserted in the gap, the 834 patent does not teach or suggest a surface for bonding the plate 2. The liquid-crystal 5 is not an optical modulation device. Further, the liquid crystal does not comprise a surface wherein a transparent plate can be formed on it. Thus, the 834 patent does not disclose or suggest a transparent plate.

Accordingly, for at least the reasons outlined above, the 834 patent fails to teach or disclose all of the features recited in claim 6. Thus, the 834 patent fails to anticipate the subject matter of claim 6 under 35 U.S.C. §102(b).

6. Claims 7-9 are Distinguishable Over the 834 Patent

Claims 7-9, which depend from claim 4, are likewise distinguishable over the 834 patent for at least the reasons discussed above, as well as for the additional features they recite. Thus, the 834 patent fails to anticipate the subject matter of claims 7-9 under 35 U.S.C. §102(b).

7. Claim 5 is Distinguishable Over the 834 and 521 Patents

Claim 5 depends from claim 4. Further, the 521 patent does not make up for the deficiencies of the 834 patent relative to claim 4, discussed above. In particular, there is no teaching, disclosure or suggestion in the 521 patent for a transparent plate formed on a light emitting surface of an optical modulation device as recited in claim 4. Thus, the combination of the 834 and 521 patents do not teach, disclose or suggest all of the features of claim 5.

Further, the Office Action has not cited any specific disclosure in the 834 and 521 patents for providing the motivation for modifying the combined apparatus to provide the missing claimed feature, i.e., antireflection film formed on a light emitting surface of the optical modulation device. It is submitted that no motivation exists to combine or modify the 834 and 521 patents to provide the missing claimed feature. In fact, such a combination and

modification constitutes an impermissible use of Appellants' disclosure based on hindsight reasoning.

Thus, the 834 patent in view of the 521 patent do not render obvious the subject matter of claim 5 under 35 U.S.C. §103(a).

8. Claim 10 is Distinguishable Over the 834 and 573 Patents

Claim 10 depends from claim 4. Further, the 573 patent does not make up for the deficiencies of the 834 patent discussed above. In particular, there is no teaching, disclosure or suggestion in the 573 patent for a transparent plate formed on a light emitting surface of an optical modulation device as recited in claim 4. Thus, the combination of the 834 and 573 patents do not teach, disclose or suggest all of the features of claim 10.

Further, the Office Action has not cited any specific disclosure in the 834 and 573 patents for providing the motivation for modifying the combined apparatus to provide the missing claimed feature, and it is submitted that no motivation exists to combine or modify the 834 and 573 patents to provide the missing claimed feature. In fact, such a combination and modification constitutes an impermissible use of Appellants' disclosure based on hindsight reasoning.

Thus, the 834 patent in view of the 573 patent, do not render obvious the subject matter of claim 10 under 35 U.S.C. §103(a).

9. Claims 11-13 are Distinguishable Over the 834 and 485 Patents

Claims 11-13 depend from claim 4. Further, the 485 patent does not make up for the deficiencies of the 834 patent discussed above. In particular, there is no teaching, disclosure or suggestion in the 485 patent for a transparent plate formed on a light emitting surface of an optical modulation device as recited in claim 4. Thus, the combination of the 834 and 485 patents do not teach, disclose or suggest all of the features of claim 11-13.

Further, the Office Action has not cited any specific disclosure in the 834 and 485 patents for providing the motivation for modifying the combined apparatus to provide the missing claimed features, and it is submitted that no motivation exists to combine or modify the 834 and 485 patents to provide the missing claimed features. In fact, such a combination and modification constitutes an impermissible use of Appellants' disclosure based on hindsight reasoning.

Thus, the 834 patent in view of the 485 patent, do not render obvious the subject matter of claims 11-13 under 35 U.S.C. §103(a).

10. Claim 14 is Distinguishable Over the 205 Patent

The invention recited in claim 14 is structurally different from Fig. 12 of the 205 patent in numerous respects. For example, the 205 patent does not disclose a partition that surrounds the plurality of optical modulation devices and the prism, the partition having a transparent plate fitted in a light incident window corresponding to a light incident surface of the at least one optical modulation device, as claimed in claim 14.

Instead, the 205 patent discloses light valves 925 R, G and B and a prism unit 910. The polarizing plates 981-983 are enclosed by a dustproof box 1500. Square openings 1501-1503 are provided in the three side walls of the box 1500 to which light is incident. Each of the openings 1501-1503 is closed in an airtight state by means of polarizing plates 981-983 fastened to the side wall from the inside thereof. The dustproof box 1500, from which light is emitted, is open.

Accordingly, for at least the reasons outlined above, the 205 patent fails to teach or disclose all of the features recited in claim 14. Thus, the 205 patent fails to anticipate the subject matter of claim 14 under 35 U.S.C. §102(b).

11. Claims 15-16 are Distinguishable Over the 205 Patent

Claims 15 and 16, which depend from claim 14, are likewise distinguishable over the 205 patent for at least the reasons discussed above, as well as for the additional features they recite. Thus, the 205 patent fails to anticipate the subject matter of claims 15-16 under 35 U.S.C. §102(b).

12. Claim 17 is Distinguishable Over the 205 and 573 Patents

Claim 17 depends from claim 14. Further, the 573 patent does not make up for the deficiencies of the 205 patent discussed above. In particular, there is no teaching, disclosure or suggestion in the 573 patent for the elements of claim 14 missing in the 205 patent. Thus, the combination of the 205 and 573 patents do not teach, disclose or suggest all of the features of claim 17.

Further, the Office Action has not cited any specific disclosure in the 205 and 573 patents for providing the motivation for modifying the combined apparatus to provide the missing claimed feature, i.e., transparent plate having a surface coated with a surface active agent or treated for electrostatic protection. It is submitted that no motivation exists to combine or modify the 205 and 573 patents to provide the missing claimed feature. In fact, such a combination and modification constitutes an impermissible use of Appellants' disclosure based on hindsight reasoning.

Thus, the 205 patent in view of the 573 patent does not render obvious the subject matter recited in claim 17 under 35 U.S.C. §103(a).

13. Claim 18 is Distinguishable Over the 834 and 730 Patents

The invention recited in claim 18 is structurally different from Fig. 5 of the 834 patent in numerous respects. For example, the 834 patent does not disclose or suggest an optical modulation device, and a transparent plate bonded to at least one surface of the optical modulation device, as claimed in claim 18.

In the 834 patent, a TFT substrate 2 and a CF substrate 3 are bonded together, and a liquid-crystal layer 5 is held in the gap therebetween. By having a liquid inserted in the gap, the 834 patent does not teach or suggest a surface for bonding the plate 2.

Contrary to the Office Action's position, the liquid-crystal 5 is not an optical modulation device. Further, the liquid crystal does not even comprise a surface wherein a transparent plate can be bonded to it. Furthermore, the 834 patent does not disclose or even suggest a transparent plate. Elements 16, 17 of the 834 patent are light shielding plates which are merely frames having an aperture at the center.

Further, the 834 patent discloses two transparent cover members 6, 7 as shown in Figure 5, that are disposed such that air gaps are created between the transparent cover members 6, 7 and the optical modulation device 1. That is, these gaps create a heat insulation layer which generates heat on the optical modulation device. Because of this insulation layer, the optical modulation device is adversely affected by the heat because the layer prevents the heat from being dissipated.

Because the 834 patent does not disclose a transparent plate bonded to at least one surface of the optical modulation device, it cannot provide advantages of the claimed invention. For example, the 834 patent does not provide the advantage of reducing heat from being directly transmitted to the optical modulation device in helping to reduce the deterioration of the optical properties of the optical modulation device. The structure of the 834 patent is completely devoid of the above-discussed advantages.

The 730 patent does not make up for the deficiencies of the 834 patent discussed above. In particular, there is no teaching, disclosure or suggestion in the 730 patent for a transparent plate bonded to at least one surface of an optical modulation device as recited in claim 18. Thus, the combination of the 834 and 730 patents do not teach, disclose or suggest

all of the features of claim 18. Therefore, the 834 patent in view of the 730 patent do not render obvious the subject matter recited in claim 18 under 35 U.S.C. §103(a).

14. Claim 19 is Distinguishable Over the 834 and 730 Patents

The invention recited in claim 19 is structurally different from Fig. 5 of the 834 patent in numerous respects. The 834 patent does not disclose or suggest an optical modulation device and a partition that surrounds the optical modulation device, as recited in amended claim 19.

Furthermore, the 730 patent does not disclose or suggest the feature of claim 19 missing from the 834 patent. The 730 patent does not disclose or suggest any partition. Thus, even if combined, the 834 patent and the 730 patent do not disclose or suggest the features of claim 19.

Accordingly, the combination of the 834 and 730 patents do not teach, disclose or suggest all of the features of claim 19. Thus, the 834 patent in view of the 730 patent do not render obvious the subject matter recited in claim 19 under 35 U.S.C. §103(a).

E. Summary

Claims 1, 2, 4 and 6-9 are distinguishable over the 834 patent under 35 U.S.C. §102(b), as even if the apparatus of Fig. 5 of the 834 patent operated in the manner asserted in the Office Action, it still would not disclose an optical modulation device and a transparent plate bonded to at least one surface of the optical modulation device, as claimed in claim 1, or an optical modulation device and a transparent plate formed on a light emitting surface of the optical modulation device, as claimed in 4.

Claims 14-16 are distinguishable over the 205 patent under 35 U.S.C. §102(b), as even if the apparatus of Fig. 12 of the 205 patent operated in the manner asserted in the Office Action, it still would not disclose a partition that surrounds the plurality of optical modulation devices and the prism, the partition having a transparent plate fitted in a light

incident window corresponding to a light incident surface of the at least one optical modulation device, as claimed in claim 14.

Claim 5 is distinguishable over the 834 patent in view of the 521 patent under 35 U.S.C. §103(a). Claim 5 depends from claim 4. Further, the 521 patent does not make up for the deficiencies of the 834 patent relative to claim 4, as discussed above.

Claims 3 and 10 are distinguishable over the 834 patent in view of the 573 patent under 35 U.S.C. §103(a). Claims 3 depends from claim 1. Further, the 573 patent does not make up for the deficiencies of the 834 patent relative to claim 1, as discussed above. Claim 10 depends from claim 4. Further, the 573 patent does not make up for the deficiencies of the 834 patent relative to claim 4, as discussed above.

Claims 11-13 are distinguishable over the 834 patent in view of the 485 patent under 35 U.S.C. §103(a). Claim 11 depends from claim 4. Claims 12-13 depend from claim 11. Further, the 485 patent does not make up for the deficiencies of the 834 patent relative to claim 4, as discussed above.

Claim 17 is distinguishable over the 205 patent in view of the 573 patent under 35 U.S.C. §103(a). Claim 17 depends from claim 14. Further, the 573 patent does not make up for the deficiencies of the 205 patent relative to claim 14, as discussed above.

Claims 18-19 are distinguishable over the 834 patent in view of the 730 patent under 35 U.S.C. §103(a), as even if the apparatus of Fig. 5 of the 834 patent operated in the manner asserted in the Office Action, it still would not disclose an optical modulation device and a transparent plate bonded to a light emitting surface of the optical modulation device, as claimed in 18, or an optical modulation device and a partition that surrounds the optical modulation device via an air layer, as claimed in claim 19.

VI. CONCLUSION

For at least the reasons discussed above, Appellants respectfully submit that claims 1, 2, 4 and 6-9 are distinguishable over the 834 patent under 35 U.S.C. §102(b); claims 14-16 are distinguishable over the 205 patent under 35 U.S.C. §102(b); claim 5 is distinguishable over the 834 patent in view of the 521 patent under 35 U.S.C. §103(a); claims 3 and 10 are distinguishable over the 834 patent in view of the 573 patent under 35 U.S.C. §103(a); claims 11-13 are distinguishable over the 834 patent in view of the 485 patent under 35 U.S.C. §103(a); claim 17 is distinguishable over the 205 patent in view of the 573 patent under 35 U.S.C. §103(a); and claims 18-19 are distinguishable over the 834 patent in view of the 730 patent under 35 U.S.C. §103(a).

For the above reasons, Appellants respectfully request this Honorable Board to reverse the rejection of claims 1-19.

Respectfully submitted,

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# APPENDIX

CLAIMS:

1. An optical modulation apparatus that modulates a light flux emitted from a light source according to image information, the optical modulation apparatus comprising:

an optical modulation device; and

a transparent plate bonded to at least one surface of the optical modulation device.

2. The optical modulation apparatus according to claim 1, further comprising:

a polarizer bonded to said transparent plate.

3. The optical modulation apparatus according to Claim 1,

said transparent plate having a surface and the surface of said transparent plate being coated with a surface active agent, or treated for electrostatic protection.

4. A projector comprising:

a light source;

an optical modulation device that modulates a light flux emitted from the light source according to image information;

a projection unit that magnifies and projects the light flux modulated by said optical modulation device; and

a transparent plate formed on a light emitting surface of said optical modulation device.

5. The projector according to Claim 4, further comprising:

an antireflection film formed on at least one surface of said transparent plate.

6. The projector according to Claim 4,

said transparent plate having a thickness and said projection unit having a focal depth, and the thickness of said transparent plate being set larger than the focal depth of said projection unit.

7. The projector according to Claim 4, further comprising:

a polarizer having an optical axis interposed between said transparent plate and said projection unit, said transparent plate being made of a drawing resin and having an optical axis, and the optical axis of said transparent plate substantially aligns with the optical axis of said polarizer.

8. The projector according to Claim 7,

said polarizer comprising a polarizing layer and a pair of substrates that sandwich said polarizing layer and are made of a substrate material, and said transparent plate being made of the substrate material used in making said substrates.

9. The projector according to Claim 7,

said polarizer being bonded to said transparent plate.

10. The projector according to Claim 4, said transparent plate having a surface and the surface of said transparent plate being coated with a surface active agent, or treated for electrostatic protection.

11. The projector according to Claim 4, further comprising a mounting member and a color synthesizing prism, said optical modulation device being mounted via the mounting member on the color synthesizing prism, said mounting member comprising:

a mounting frame plate composed of a first frame member and a second frame member that sandwich said optical modulation device

a fixed frame plate in a fixed contact with a light incident surface of said color synthesizing prism; and

an intermediate frame plate sandwiched between said mounting frame plate and said fixed frame plate.

12. The projector according to Claim 11,

said mounting frame plate being made of a resin containing glass fiber.

13. The projector according to Claim 11,

said mounting frame plate being made of metal.

14. A projector comprising:

a light source;

a plurality of optical modulation devices that modulate a light flux emitted from the light source according to image information;

a prism that synthesizes the light flux modulated by said plurality of optical modulation devices;

a projection unit that magnifies and projects the light flux synthesized by said prism; and

a partition that surrounds said plurality of optical modulation devices and said prism via an air layer and thereby separates said plurality of optical modulation devices and said prism from said light source and said projection unit,

said partition having a transparent plate fitted in a light incident window corresponding to a light incident surface of at least one optical modulation device, and a light outgoing window that emits the light flux modulated by said at least one optical modulation device therefrom.

15. The projector according to Claim 14, further comprising:

a fan that circulates air located inside said partition.

16. The projector according to Claim 14, further comprising:

a polarizer bonded to said transparent plate.

17. The projector according to Claim 14,

said transparent plate having a surface and the surface of said transparent plate being coated with a surface active agent, or treated for electrostatic protection.

18. A projector comprising:

a light source;

an optical modulation device that modulates a light flux emitted from the light source according to image information;

a transparent plate bonded to a light emitting surface of said optical modulation device;

a power supply unit;

an interface circuit;

a control circuit that controls the optical modulation device; and

an outer casing that accommodates the light source, the optical modulation device, the transparent plate, the power supply unit, the interface circuit, and the control circuit.

19. A projector comprising:

a light source;

an optical modulation device that modulates a light flux emitted from the light source according to image information;

a projection unit that magnifies and projects the light flux modulated by said optical modulation device;

a partition that surrounds said optical modulation device via an air layer and thereby separates said optical modulation device from said light source and said projection unit;

a power supply unit;

an interface circuit;

a control circuit that controls the optical modulation device; and

an outer casing that accommodates the light source, the optical modulation device, the partition, the power supply unit, the interface circuit, and the control circuit.